

### REMARKS

Applicant appreciates the detailed examination evidenced by the Official Action mailed April 4, 2007 (hereinafter The Official Action). Applicant also appreciates the withdrawal of the previous rejections in response to Applicant's Pre-Appeal Brief Request for Review and the indicated allowability of Claims 2, 4, 6 and 7. *Official Action, page 4*. In response, Applicant has amended Claim 5 to include the recitations of allowable Claim 7 thereby placing Claims 5 and 8-10 in condition for allowance.

Further Applicant has amended independent Claims 1 and 24 to further clarify the patentable subject matter recited therein. Applicant respectfully submits that the amended claims are patentable over Gonzalez for at least the reasons described herein.

#### **Allowed Claim 4 has been amended to correct a minor typographical error.**

Upon review of allowed Claim 4, Applicant has noted a typographical error, which has been corrected by the present amendment. In particular, Applicant has removed an erroneous recitation of "in" and has added at "a bottom" of the recess to further clarify this claim. Applicant respectfully submits that the present amendment to allowed Claim 4 does not change the scope thereof.

#### **The Amended Claims Are Patentable Over Gonzalez**

Claims 1, 3, 5, 8-11, and 24 stand rejected under 35 USC § 102 over U.S. Patent No. 5,831,276 to Gonzalez, et al. ("Gonzalez") *Official Action, page 2*. In response, Applicant respectfully points out that even assuming for the sake of argument that Gonzalez disclosed or suggested many of the recitations alleged by the Official Action, Gonzalez still does not disclose all the recitations of independent Claims 1 and 24. For example, independent Claim 1 recites in part;

a bottom electrode having an interlayer dielectric layer thereon, the bottom electrode having a recess therein that extends beyond a boundary between the bottom electrode and the interlayer dielectric; and

a phase changeable layer in the recess including a protruding portion of the phase changeable layer that protrudes into the bottom electrode beyond the boundary, wherein the recess extends beyond the

boundary to define a side wall of the recess that contacts the protruding portion of the phase changeable layer and **wherein the phase changeable layer contacts the bottom electrode within confines of the recess.** *Amended independent Claim 24 include recitations similar to those highlighted above.*

Applicant respectfully submits that Gonzalez does not disclose, at least, the highlighted portions of the recitations shown above as strictly required under section 102. In particular, Figures 12 and 12a of Gonzalez show that the memory element 32 includes upper and lower electrodes 32c and 32b, respectively and a chalcogenide layer 32a sandwiched between. However, Figure 12a of Gonzalez clearly shows that layer 32d separates the chalcogenide layer 32a from the lower electrode 32b. Accordingly, Gonzalez does not disclose, at least, that "the phase changeable layer contacts the bottom electrode within confines of the recess" as recited in independent Claims 1 and 24.

However, to further distinguish the present patentable subject matter from Gonzales, Applicant has further amended independent Claim 1 to recite in part that:

...the recess extends beyond the boundary to define a side wall of the recess that contacts the protruding portion of the phase changeable layer.

As shown in Figures 12 and 12a of Gonzalez, the portion therein in which the recess is alleged to be formed (i.e., the electrode layer 32b) does not define a side wall that contacts a protruding portion of the phase changeable layer, as claimed. Furthermore, the dependent claims are patentable at least per the patentability of amended independent Claim 1.

Applicant has also amended independent Claim 24 to further distinguish the present patentable subject matter from Gonzales. In particular, Claim 24 has been amended to recite in-part:

a phase changeable layer extending through the interlayer dielectric layer and protruding into a recess in the bottom electrode wherein the phase changeable layer contacts the bottom electrode with confines of the recess, wherein the bottom electrode defines a sidewall of the recess that contacts the protruding portion of the phase changeable layer, and **a depth of the recess extending beyond the boundary is less than a thickness of a portion of the phase changeable layer subject to a phase change during heating of the phase changeable layer.**

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Even assuming for the sake of argument that the depression in the center portion of the layer 32b providing the lower electrode in Gonzales somehow discloses the claimed recess, there is nothing in Gonzales that discloses a particular depth for the recess within the electrode as claimed. Accordingly, amended independent Claim 24 is patentable for at least these additional reasons.<sup>1</sup>

Accordingly, the rejections of Claims 1, 3 and 24 are have been overcome and should be withdrawn for at least these reasons. If any informal matters arise the Examiner is encouraged to contact the undersigned by telephone.

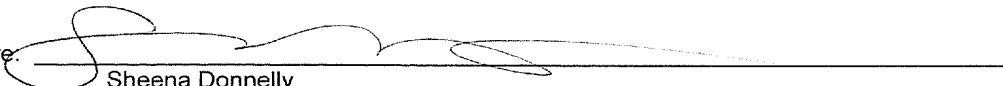
Respectfully submitted,

  
Robert N. Crouse  
Registration No. 44,635

**USPTO Customer No. 20792**  
Myers Bigel Sibley & Sajovec  
Post Office Box 37428  
Raleigh, North Carolina 27627  
Telephone: 919/854-1400  
Facsimile: 919/854-1401

**CERTIFICATION OF TRANSMISSION**

I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4) to the U.S. Patent and Trademark Office on June 22, 2007

Signature. 

Sheena Donnelly

<sup>1</sup> New dependent Claim 25 includes recitations that are similar to those included in amended independent Claim 24 and are, therefore, patentable for at least these additional reasons.